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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/699,845

11/04/2003

Sung-Su Jung

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EXAMINER

LIN, JAMES

ART UNIT

PAPER NUMBER

1792

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/699,845	<b>Applicant(s)</b> JUNG ET AL.	
	<b>Examiner</b> Jimmy Lin	<b>Art Unit</b> 1792	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 March 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) 1-7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/11/2009 has been entered.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 8 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is not support for "loading a first substrate and a second substrate having a plurality of panel regions on a table". The specification only seems to teach that only a single substrate is loaded onto a table and does not teach anything about a second table being loaded.

There is no support for "wherein the liquid crystal material is still dispensed if the intermediate amounts of gas is less than the divided parts of the second flow amount of gas and the liquid crystal material is not dispense and the syringe is exchanged into a new syringe filled with the liquid crystal material if the intermediate amount of gas is larger than the divided parts of the second flow amount of the gas". The specification only teaches that dispensing can still be performed if a detected flow amount of gas is in the range between the first flow amount and a sum of the first and second flow amounts [0030], but does not teach how it relates to a divided parts of the second flow amount of gas. For the purpose of this examination, the claim will be interpreted to be at least inclusive of wherein the continuation of the dispensing is based on either the second flow amount of gas or the divided parts of the second flow amount of gas.

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4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recitations of “loading a first substrate and a second substrate having a plurality of panel regions on a table” and “moving the table on which the first or the second substrate is loaded” render the claim indefinite. The claim requires loading a first and second substrate but then only requires moving the table having only one of the substrates loaded thereon. It is unclear as to whether both substrates are required to be loaded onto the table or not. For the purpose of this examination, the claim will be interpreted as being at least inclusive of moving the table having either only a single substrate or a first and a second substrate.

Claim 8 recites the limitation "the divided parts of the second flow amount of gas" in lines 29 and 31-32. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al. (U.S. Publication No. 2001/0013920) in view of Shimano (U.S. Patent No. 5,277,333) and Hachiman et al. (JP 2001-356353; listed in the IDS filed 12/19/2003).

Hashimoto teaches a method of making a liquid crystal display (LCD) (abstract). A first substrate 21a is loaded on a table 31 (Fig. 14). The substrate has a plurality of panel regions separated by spacers 3 (Fig. 2b). Liquid crystal can be injected onto the substrate using a syringe

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42 [0050]. An air pressure source 44 supplies air into the syringe and a controller 43 controls the air pressure source to regulate the volume of the liquid crystal composition to be discharged ([0109]; Fig. 14). A second substrate 21b is then placed onto the first substrate while sitting on the table (i.e., the second substrate is loaded on the table) (Fig. 14), causing the liquid crystal material to spread (Figs. 2c, 6 and 19b). Repeated dispensings would be performed when the syringe was dispensed onto subsequent substrates. The transition to the subsequent substrates would necessarily require intermediate flow amounts of gas.

Hashimoto does not explicitly teach detecting the intermediate amounts of gas corresponding to the dispensed amount of the dispensing material in the syringe. However, Hashimoto does teach that an air pressure source 44 supplies air into the syringe and a controller 43 controls the air pressure source to regulate the volume of the liquid crystal composition to be discharged ([0109]; Fig. 14). The gas flow is controlled in order to regulate the amount of liquid crystal dispensed. The measurement of a controlled flow would have been an obvious modification to one of ordinary skill because additional measurements would have provided further control and precision. Furthermore, the flow of gas can be calculated using the ideal gas law  $PV = nRT$  ( $P$  is pressure,  $V$  is volume,  $n$  is the amount or mols of gas,  $R$  is a constant,  $T$  is temperature). The flow amount of gas (i.e., the variable  $n$ ) can be calculated because pressure, volume, and temperature are known. It would have been obvious to one of ordinary skill in the art at the time of invention to have calculated the amount of gas in the dispensing of Hashimoto using known relationships, such as the ideal gas law.

Hashimoto does not explicitly teach determining a second flow amount of gas by supplying the gas to the syringe, wherein the second flow amount of gas is the amount of gas such that the syringe is filled with the minimum quantity of residual dispensing material that is enough to ensure a previous dispensing but not enough for a subsequent dispensing, and wherein liquid crystal material is still dispensed if the intermediate amounts of gas is less than the divided parts of the second flow amount of the gas and the liquid crystal material is not dispensed and the syringe is exchanged into a new syringe filled with the liquid crystal material if the intermediate amount of gas is larger than the divided parts of the second flow amount of gas. However, Shimano recognizes the need to prevent further dispensing once a preset minimum value is reached in a syringe and replacing the syringe with a new filled syringe once the preset minimum

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is reached (col. 5, lines 38-40). An obvious preset minimum value would be a value that does not allow a sufficient amount for a subsequent dispensing because such a minimum value would allow the most dispensings from a single syringe so that the number of refills required is reduced and because an insufficient dispensing would cause a defect. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have stopped the dispensing once a preset minimum amount of liquid crystal material is left in the syringe of Hashimoto and to have replaced the syringe with a new filled syringe with a reasonable expectation of success. One would have been motivated to do so in order to have increased the process efficiency by reducing the number of refills and to have prevented a defect in the LCD. The determination of the second flow amount of gas would have been available to one of ordinary skill knowing the correlation between the amount of gas used compared to the amount of liquid crystal dispensed, wherein the correlation can be calculated using the ideal gas law.

As to determining a residual number of dispensings remaining in the syringe by comparing the number of intermediate amounts of gas with the second flow amount of gas, such a determination merely requires basic arithmetic and, thus, it would have been obvious to one of ordinary skill in the art at the time of invention to have made such a determination with a reasonable expectation of success.

Hashimoto does not explicitly teach determining a first flow amount of gas by supplying a gas to a syringe filled with the dispensing material, wherein the first flow amount of gas is the amount of gas necessary for the syringe to be capable of dispensing in response to an additional amount of gas. However, a space in the piping between the syringe and the gas supply and a space above the dispensing material in the syringe will exist and need to be filled by the supply gas. Any amount of gas flowing into these spaces without a corresponding dispensing would cause inconsistencies and possible defects in the first LCD substrate because the amount of liquid crystal dispensed would be less than the desired amount. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have determined the first flow amount of gas in the dispensing method of Hashimoto with a reasonable expectation of success. One would have been motivated to do so in order to have performed consistent dispensings and to have prevented defects.

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Hashimoto teaches that the syringe can be moved during the deposition of the liquid crystal ([0109]; Fig. 13), but does not explicitly teach that the table can be moved during the dispensing of the liquid crystal. However, Hachiman teaches a method of dispensing liquid crystal from a nozzle onto an LCD substrate while moving the table in the XY-direction [0012]-[0014]. One of ordinary skill in the art would have recognized that the moving of the syringe as taught by Hashimoto and the moving of the table as taught by Hachiman would have been operably equivalent and that the use of one method over the other would have achieved predictable results. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have moved the table of Hashimoto, as opposed to moving the syringe, in the method of dispensing liquid crystal with a reasonable expectation of success. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness (MPEP 2144.07). Hachiman teaches dispensing of the liquid crystal material on multiple portions of the substrate [0013], which is being interpreted as "repeatedly dispensing the liquid crystal material...onto a plurality of panel regions" as required by the claim.

### ***Response to Arguments***

8. Applicant's arguments filed 2/12/2009 have been fully considered but they are not persuasive.

Applicant argues on pg. 7 that claim 8 is allowable for reciting the combination of 1) "loading a first substrate and a second substrate having a plurality of panel regions on a table", 2) "providing a dispenser having a syringe", 3) "repeatedly dispensing the liquid crystal material using the syringe filled with the liquid crystal material onto a plurality of panel regions of the first substrate or the second substrate by supplying intermediate flow amounts of gas to the syringe and moving the table on which the first substrate or the second substrate is loaded", 4) "attaching the first substrate and the second substrate" and 5) "spreading the liquid crystal material on the panel regions between the attached first and second substrates". However, Hashimoto teaches the limitations of 1, 2, 4 and 5, and the limitations of 3 would have been obvious over Hachiman. See above rejection for details.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Lin whose telephone number is (571)272-8902. The examiner can normally be reached on Monday thru Friday 8AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jimmy Lin/  
Examiner, Art Unit 1792

/Timothy H Meeks/  
Supervisory Patent Examiner, Art Unit  
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